



GRIMM Aerosol

Optical Technology
For Dust Measurement
Giving You
PM₁₀ , PM_{2.5} & PM_(10 - 2.5)
Simultaneously

The Light Scattering Technology

The Technology

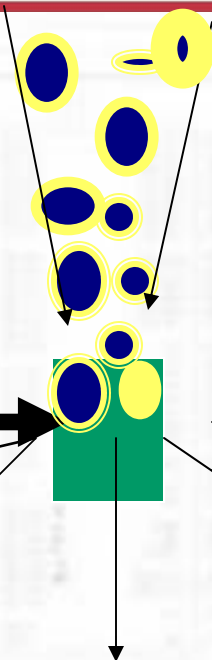
Light Scattering Methods

Measuring Chamber

Light
source



Reflection



Only **single particle counting** permits an individual particle size selection and consequently proper AEROSOL properties.

Concentration & Size Distribution

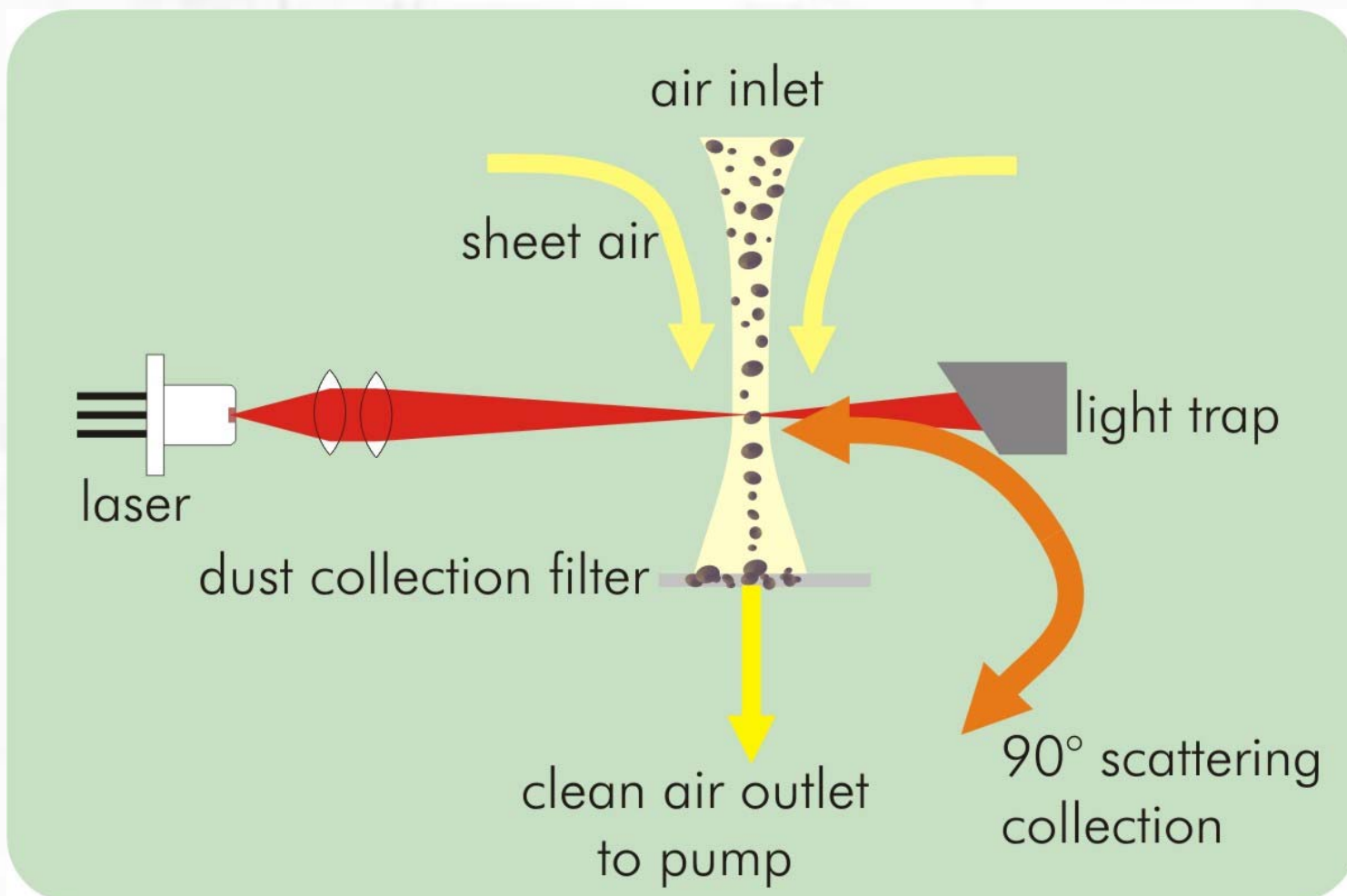
Extinction = **Opacity**

Total Scattered light = Nephelometry

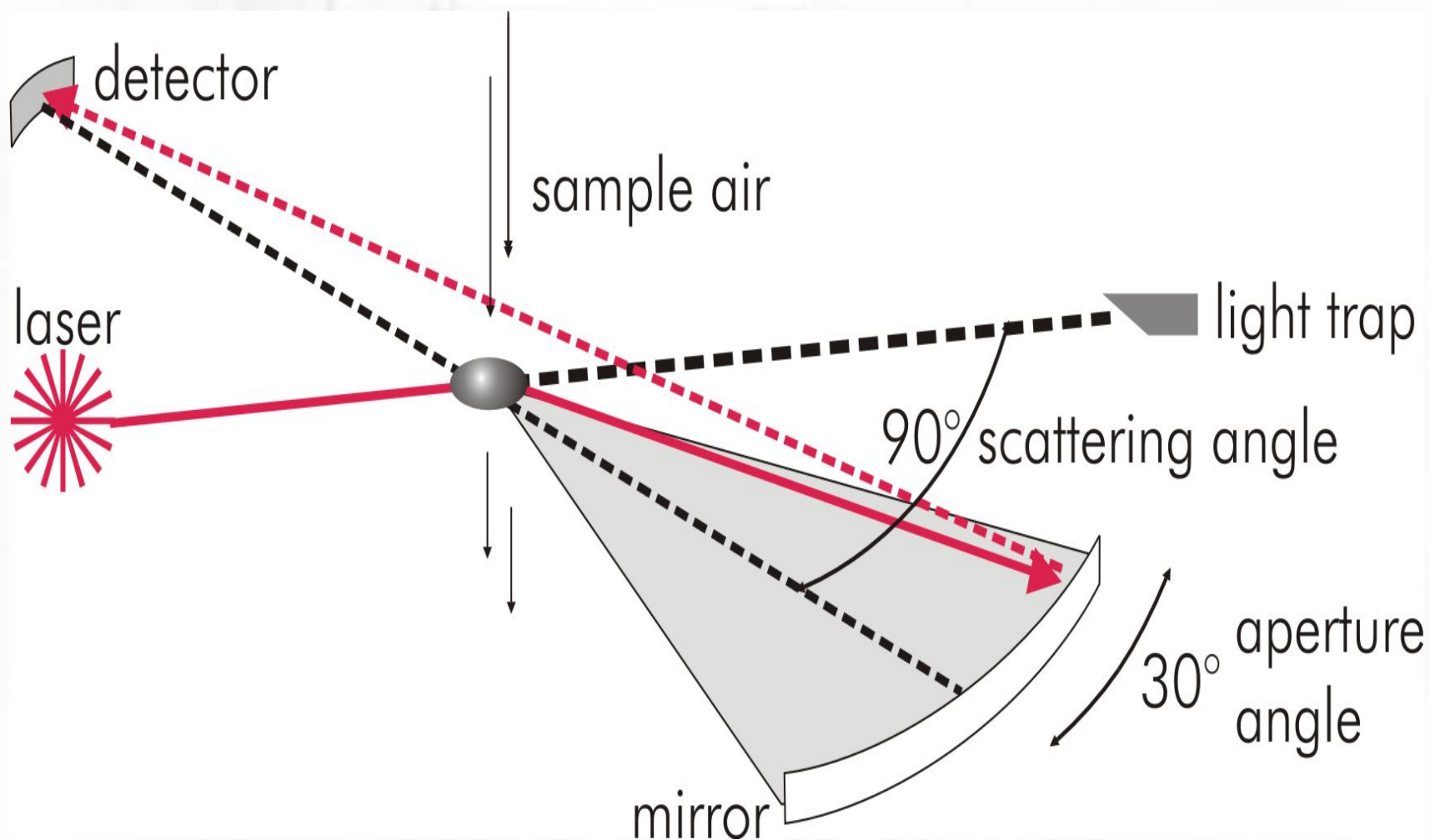
Not a size selective method and therefore not useful for dust mass determination

Only a high resolution wide range multi-channel Aerosol Spectrometer can measure the concentration without dilution and give a truly **REPRESENTATIVE PARTICLE SPECTRUM**

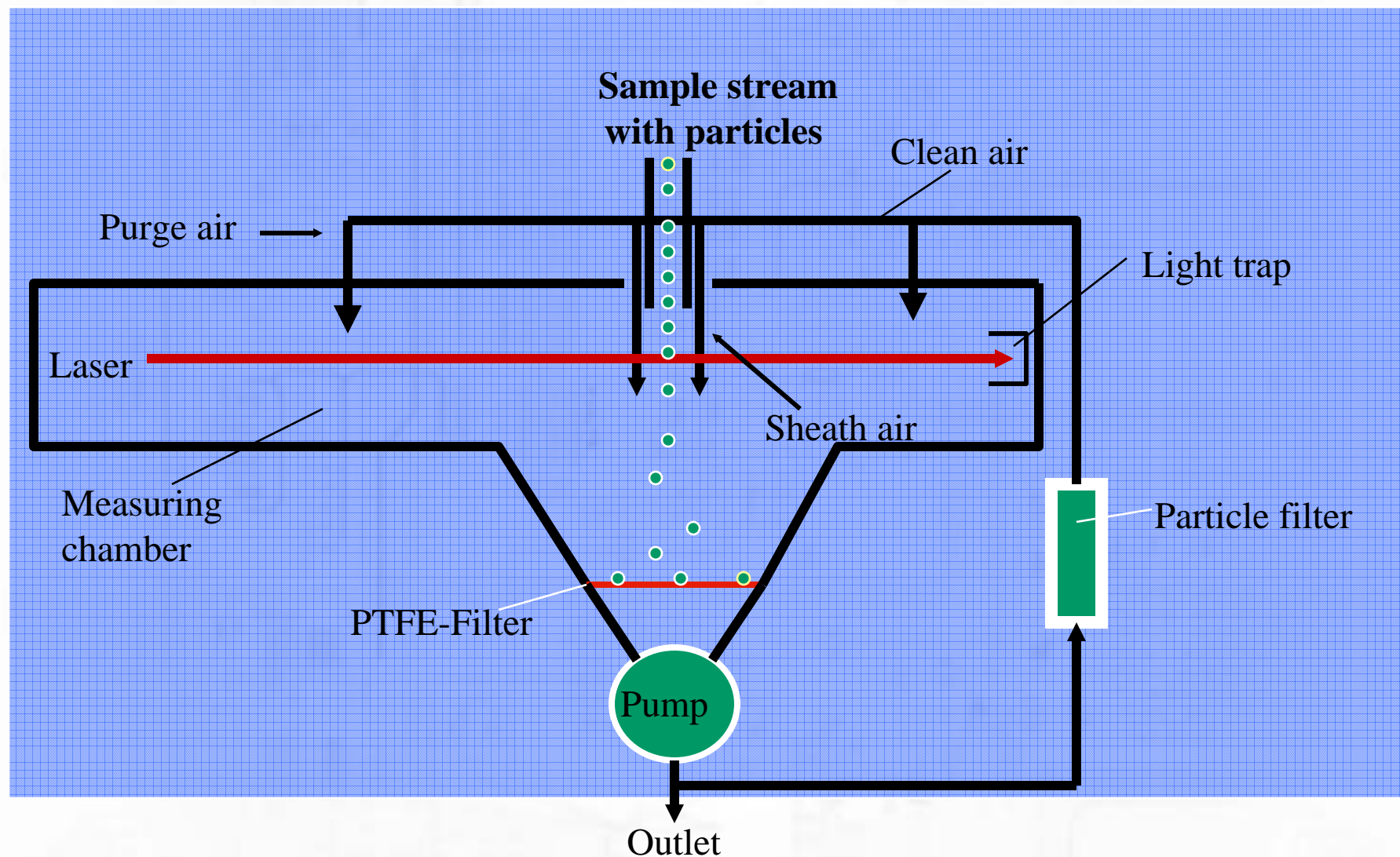
Optical Detection System



GRIMM Spectrometer Optic



Sheath Air to protect Optics



The Products



19" Stationary Dust Monitor



GRIMM # 180

Simultaneous
Monitoring
of Fine Dust
in $\mu\text{g}/\text{m}^3$ for

TSP

PM₁₀

PM_{10-2.5}

PM_{2.5}

PM₁



Easy Rack Mount Installation

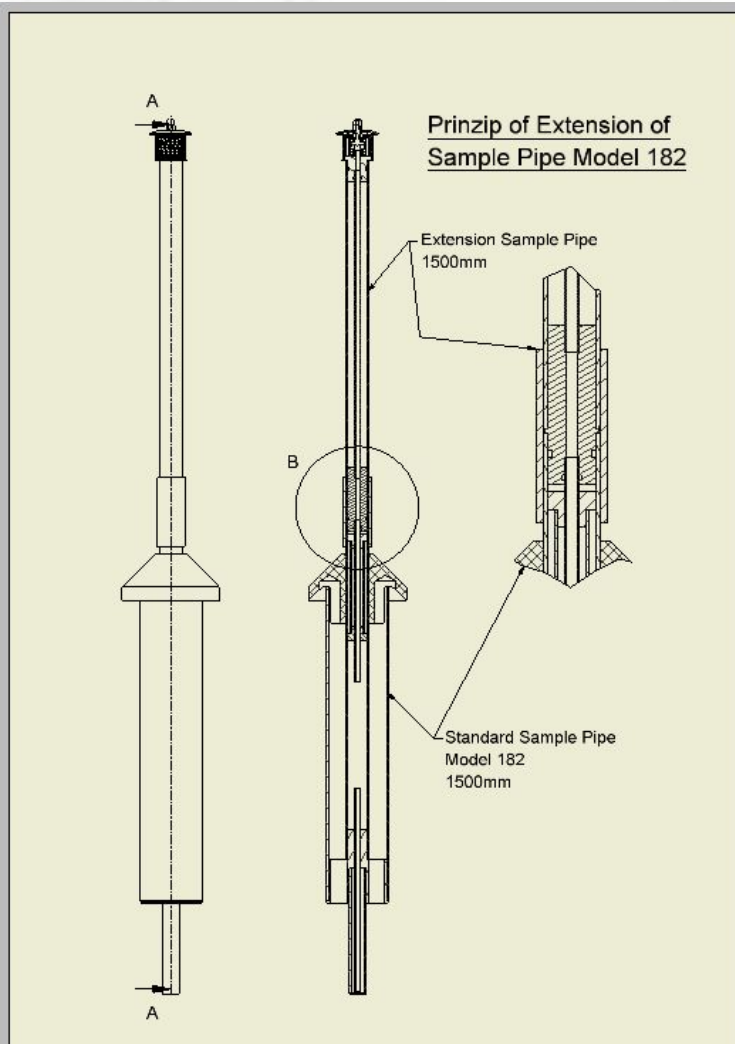




Nafion Dryer (Permapure)



SAMPLE PIPE EXTENSION



1.5 m
Extension
for
Total length
of
3.0 m



19" Stationary Dust Monitor



Trailer installation in Austria





Looking inside the Grimm 180

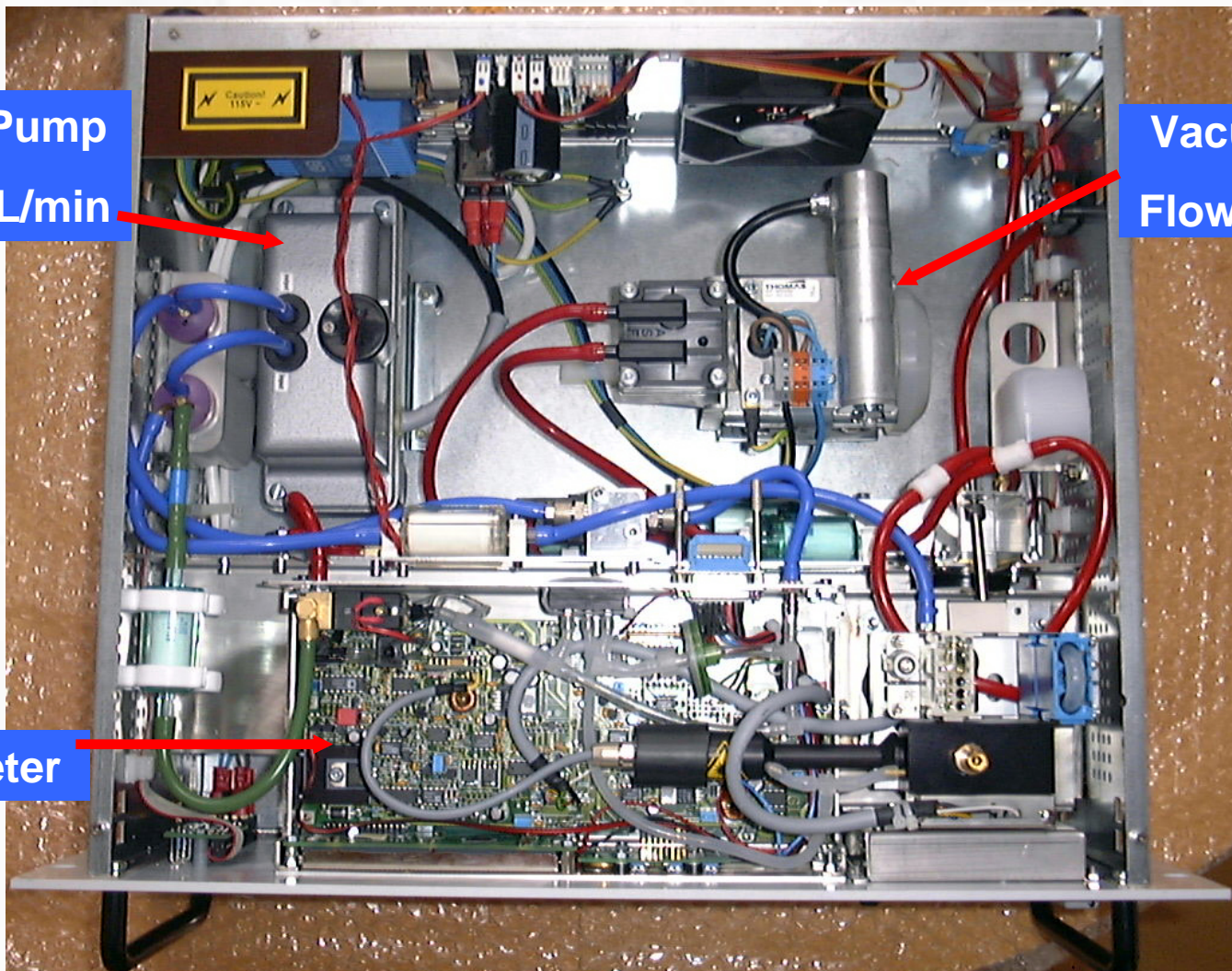
Sampling Pump

Flow = 1.2 L/min

Vacuum Pump

Flow = 1.8 L/min

Spectrometer



Evaluation Site in Canada

Ottawa, Env. Canada.





Evaluation Site in Canada

Williams Lake, BC



Evaluation Site in Canada

Williams Lake, BC



Maintenance & Calibration

CALIBRATION TOWER



The Grimm 180 is calibrated once a year in our Atlanta office using a calibration tower and a reference unit for accurate particle count within $\pm 2\%$ for each of the 31 size channels

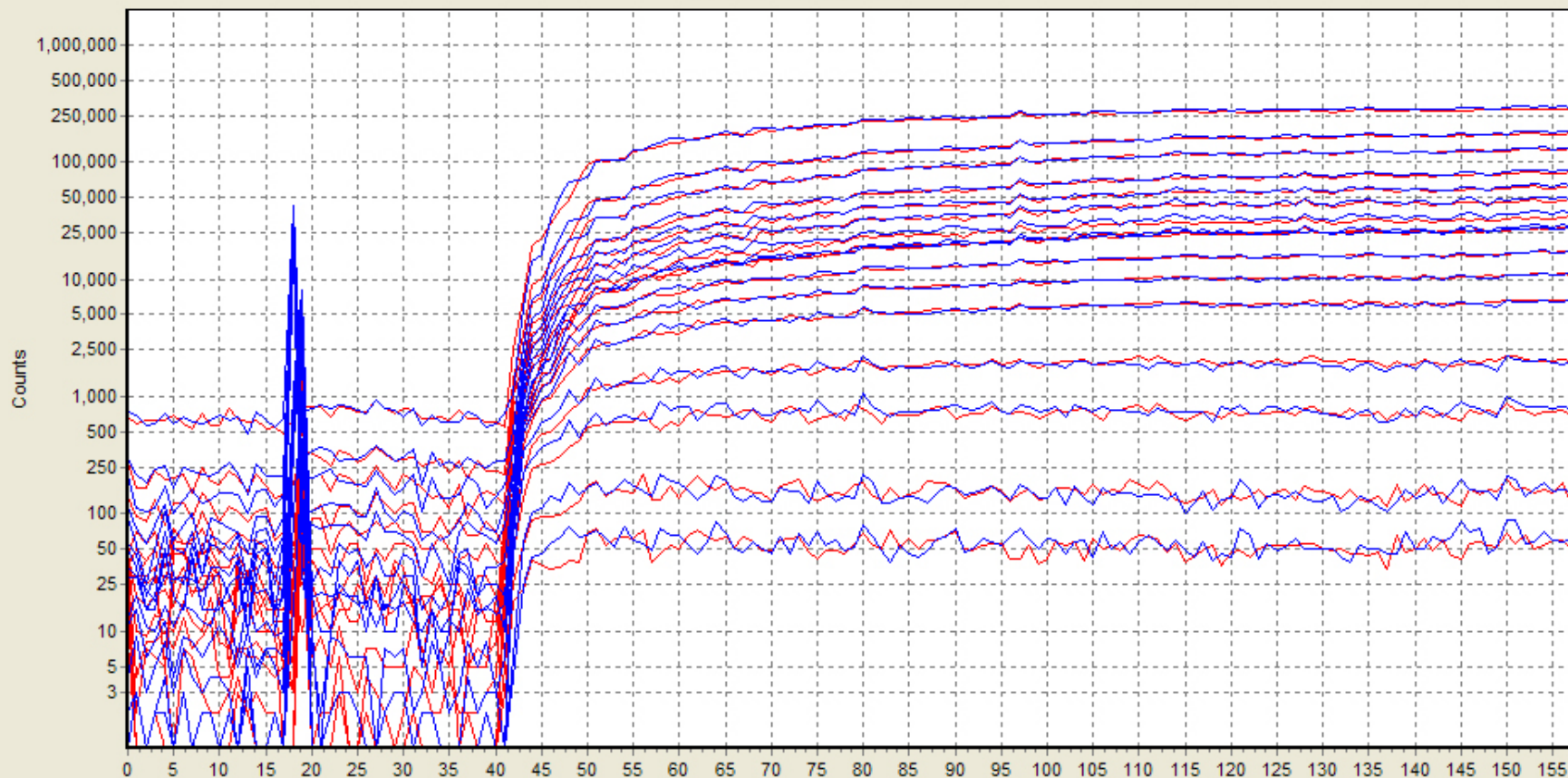


Calibration Verification

Mother (7F010015)

Candidate (7F020043)

Compare Mother Unit - Candidate Unit 1 - Date: 1/10/07 3:34:40 PM
7F010015 - 7F020043

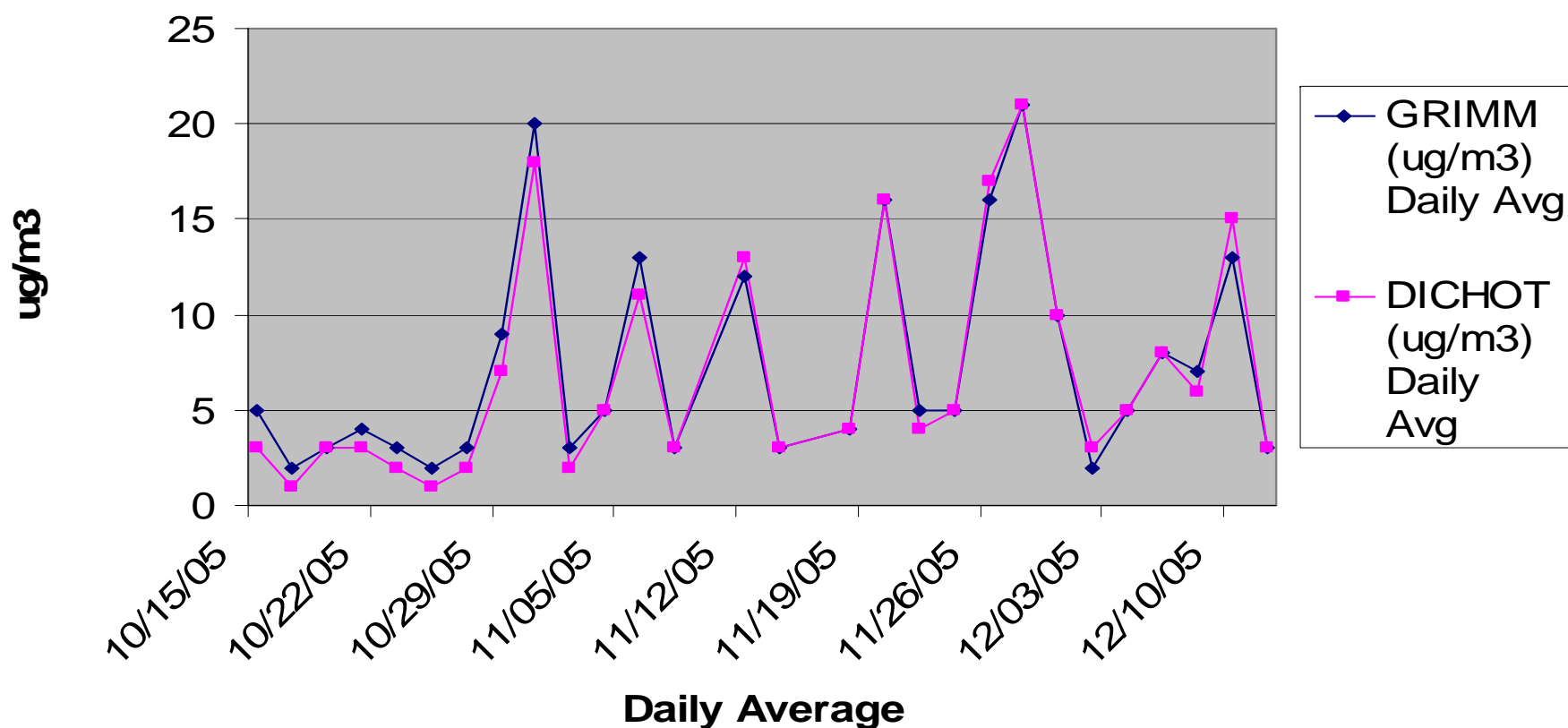


Field Results



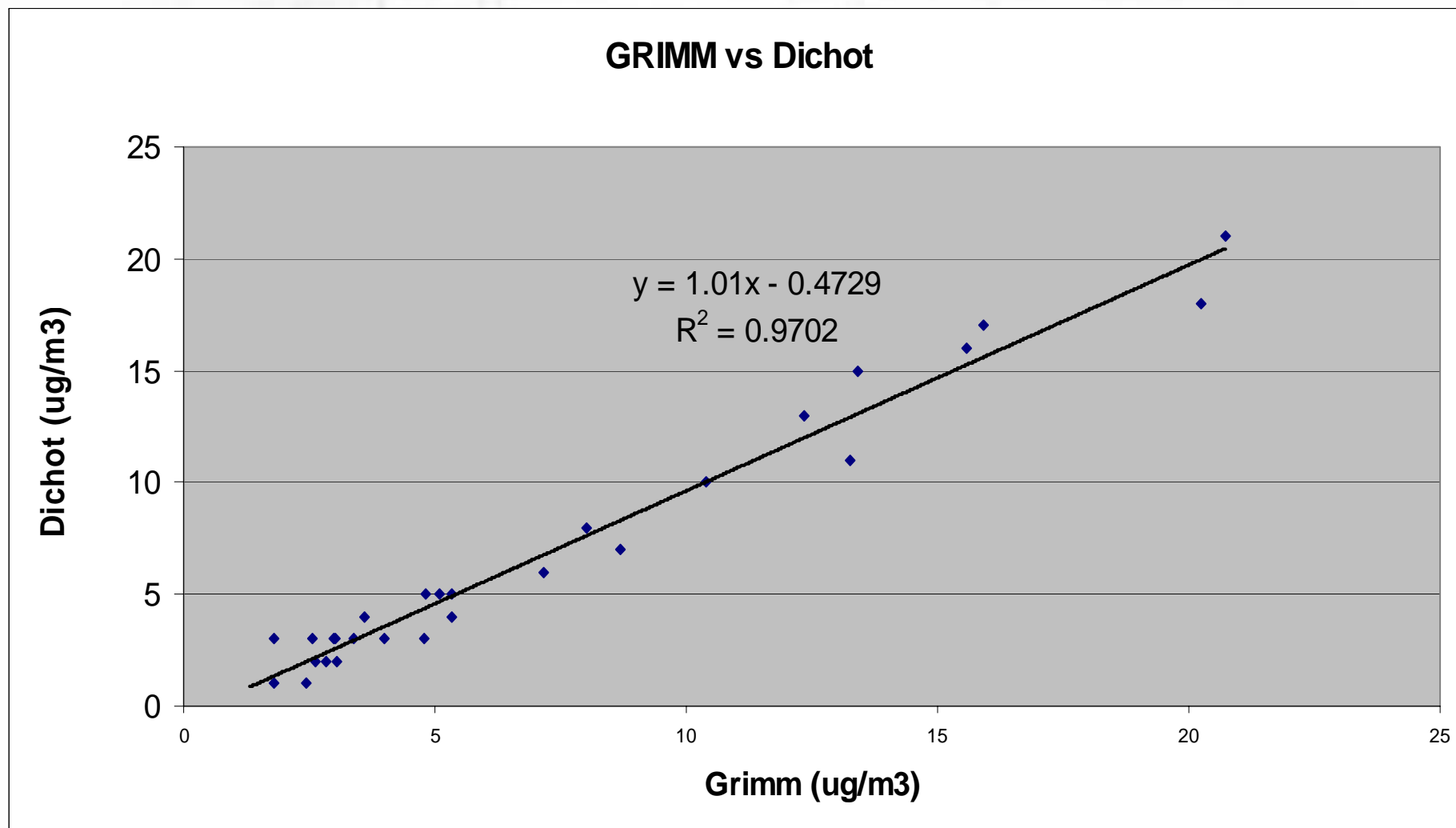
Results Ottawa, Ontario, Canada Oct-Dec 2005 By Environment Canada

PM2.5 Data Grimm vs Dichot





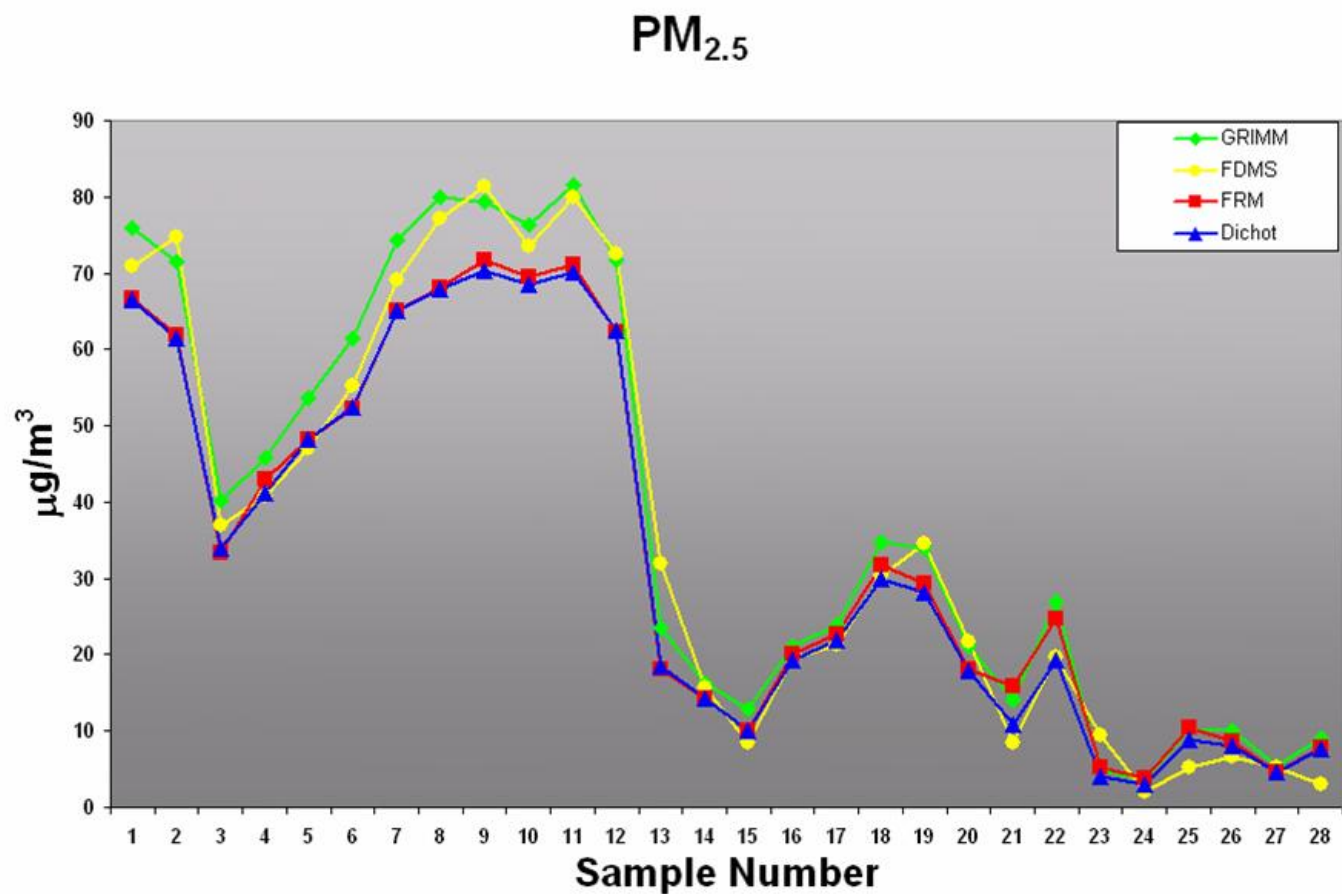
Results Ottawa, Ontario, Canada Oct-Dec 2005 By Environment Canada





Results Lindon, UT Jan-Feb 2007 by US EPA

BRETT D. GROVER¹, Russell W. Long¹, Robert W. Vanderpool¹, Robert W. Murdoch², and Delbert J. Eatough³



¹ U.S. Environmental Protection Agency, National Exposure and Research Laboratory, Durham/RTP, NC 27711

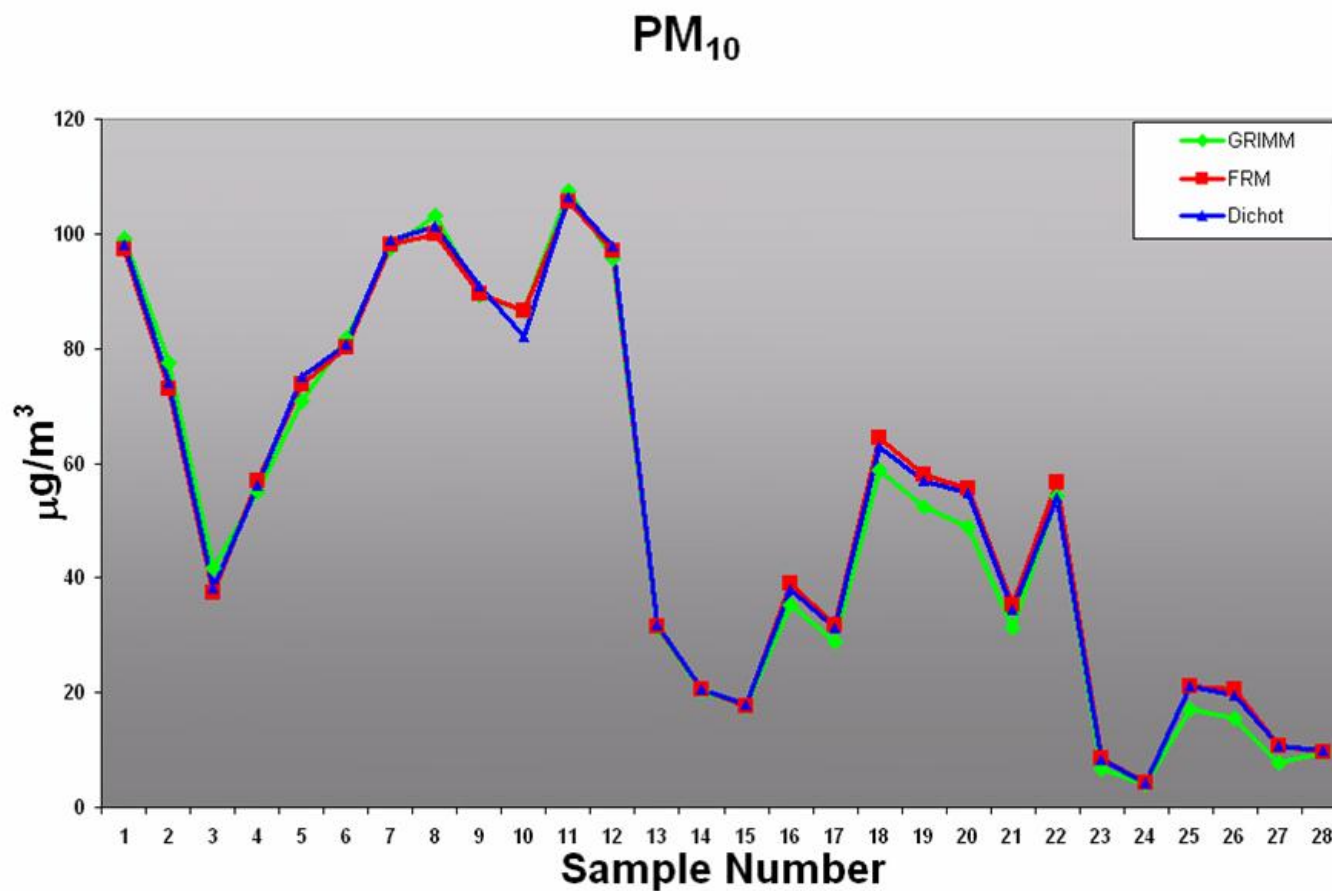
² RTI International, Durham/RTP, NC 27709

³ Brigham Young University, Department of Chemistry and Biochemistry, Provo, UT 84602



Results Lindon, UT Jan-Feb 2007 by US EPA

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THANKS